SEQUENCE LISTING

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<120> Human Ion Channels

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<151> 2000-07-05

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tggaatatta agagttccaa aaagagaaca gaggaaaaga tgaggaagaa attaaggatg     180

aactaaccgt aagaaaattt gccaaaacag agaatgagtc ttcaatgcta aaaggttgac     240

tgagttccca aaaaagaccc gtcctaaggc acatcagtgt gaaattcagg acactgttat     300

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attccaagtg aaaattattt tcaacctaga atttggtatc aaaactacca atcaagtatg     480

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cccattgcac tgtcaaaatg gaggtgaaaa tttaaaacaa gaccaaaatg caagtaaagt    180

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aagtccttcc gtggcctact gagtggattt caacccccta tcgattgcct gctctttttg      360

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tgcaagagtt tccctgggta aatctttccc catctttata aaatgttaac aatgggagaa      360

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gcggcccctg cctcttgcgt tatctctcct ccagcatgga tgtggataaa accccaaaag      360

gcctcacagc atatgtaagt aatgaaggtc gcatcaggta taaaaaaccc atgaagggggg      420

acagtatctg taacctggac atcttctact tccccttcga ccagcaaaac tgcacactca      480

ccttcagctc attcctctac acaggtaagt tgcagtgagg tctcagggat ggggtgaatg      540

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<212>   DNA
<213>   Homo sapiens

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ttgacacaac tccttcccca cacacaggag tggagcgact acaaactgcg ctggaacccc     180

actgattttg gcaacatcac atctctcaag gtcccttctg agatgatctg gatccccgac     240

att                                                                   243


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<213>   Homo sapiens

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gacgtcatct actcgctcat catcctccgg aagccgctct tctacgtcat taacatcatc     120

gtgccctgtg tgctcatctg gggcctggtg ctgcttgcct actttctgcc agcacaggt      180

aagcagtggc ccctaaccta cccccaaacc cgggctcgct cccgggaggc ggggcccgct     240

ctcact                                                                246


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<213>   Homo sapiens

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ggttagtacg aagccccacc ccgaaaccgg gctgcaccgc cccctccgcg cttacgtggc     120

gcagccgcgg ggacatggcg tgggtggtgg gcgtccgctg ggacacgttg agcacgatga     180

cgcaattcat gacaatgagc gtggcgacca ccatgacgaa aataaggaac ctgaggagcc     240

cggtaaggca tgacatcacc ggtcctcctt ccagctaccg aaggcgccgc gcgctgacct     300

cacaaacacg gcttctcctg gtacgggctg gttacgccct ccagctgcgc cccctacacg     360

acgacagacg cgtcccccaa cccttctaac tgtacctacc acttgtggcg gccatgaagg     420

ggacccccag ctccctgga                                                  439


<210>   27
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<212>   DNA
<213>   Homo sapiens

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aaacatgctt tgtgttgttt gctgatgtat tgagtaatag aatgtcagat ggaagcaagt     120
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aaattatttt acaatgtatt ttaagcctta cttggaaaag taacaccaac aaatactatt      180

aagaattcat tgatgtttga ccttacatag aaagtaagtc gtccataaat atttgtcaat      240

ggtgaaagag tgaataaata agcaattaag caatatctat tctttcattt gggcttaata      300

tttgtctttt ttccacagca tcctgactcc aaatatcatc tgaagaaaag gatcacttct      360

ctgtctttgc caatagtttc atcttccgag gccaataaag tgctcacgag agcgcccatc      420

ttacaatcaa cacctgtcac acccccacca ctctcgccag cctttggagg caccagtaaa      480

atagaccagt attctcgaat tctcttccca gttgcatttg caggattcaa ccttgtgtac      540

tggggtagtt ttatctttcc aaagatacaa tgggaagtga gtaccagtgt tgaatag       597
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<210>    28
<211>    263
<212>    DNA
<213>    Homo sapiens

<400>    28
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ggcctgagtc ctgtgctcac atggcgtatg ccgcccagta gatgacattg acggccgcaa      120

acgccgcagg gaacacagcg cgggcgttaa tgtcaatggt gtctgcgtcc atgggcctga      180

gccgggcacg gatgcccccc tggcctcctg agcgggctgc cccctccttc ttcgtctccc      240

ctgtctccac ccccaccgac ctg                                             263
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<210>    29
<211>    401
<212>    DNA
<213>    Homo sapiens

<400>    29
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gatgttttac acgattaatc tgatcatccc ttgtctcttt atttcatttc taaccgtgtt      120

ggtcttttac cttccttcgg actgtggtga aaaagtgacg ctttgtattt cagtcctgct      180

ttctctgact gtgttttgc tggtcatcac ataaaccatc ccatccacat ctctggtggg      240

cccactggtg ggtgagtacc tgctgttcac catgatcttt ggcacactgg ccatcgtggt      300

gactgtgttt gagttgaaca tacactaccg caccccaacc acgcacacaa tgcccaggtg      360

ggtgaagaca gttttcctga agctgctgcc ccaggtcctg c                         401
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<211>    213
<212>    DNA
<213>    Homo sapiens

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cttggccaaa atcctggagg aggtccgcta cattgccaac cgcttccgct gccaggacga      120

aagcgaggcg gtctgcaacg agtggaagtt ccccgcctgt gtggtggacc gcctgtgcct      180
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catggccttc tctgtcttca ccatcatctg cac                              213


<210>   31
<211>   639
<212>   DNA
<213>   Homo sapiens

<400>   31
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ataggtcaag aggacaatca aagaagctgc tgggatcaga agtcaaacag gggcccctgg   120

actcacataa aacatgatct ggtcatatag gttgttgccc atggacatct ttggggtggc   180

cttgttgatg cccaagagct cccactcccc ctgggtttgg atgactttgc gagacgtgtc   240

tgtgatctcc cacacctcct tgtccatgcc cagcagcatg ctgtccactg gaagggaggc   300

cggtcagttc attgcagacg ttttcccaag cctcccgccc acgaaattgg agtcctcccc   360

cactgagctt ctaaaccaaa ttttcctcta ccttttaaa gcagggtatc ctggttttct    420

cagaagtggg ttacccgact agcaattcat atgtgtgtgg gcagcggcat taatttcttt   480

tgttgttgaa aacaagagtg agtcaagttc gttatgggaa tattggatat gactgaaacg   540

tgagtcaaga acttttggag tcattcctat tttccttctc agtcccccag tcgtatggtg   600

gtgtttttagt ggaatcaagc ttgaatagct caatatttt                          639


<210>   32
<211>   685
<212>   DNA
<213>   Homo sapiens

<400>   32
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gaaacacaaa agctctatct aagaaggaaa ccccatgtac acacttcttt ttaccacccg   120

cagtcttcaa ctacacaata gcaatgtgtg tctccatatc acttgtcttt tgatttgtct   180

tgtcttttga tttgttcaat cattgcatgc ctctataata taaatattat attaccatgc   240

cttctaaggt cattgatgaa agttatttta ttcatccttg catcttctat tcaggttttg   300

gcacatagta ggcactataa ataaatgtac aatcaatgaa gcaatgctgt gcattttaaa   360

ctaaagatag ctaactaaag tcaaagaacc caagtaattc atttgagtac acactgttca   420

gctggaaccc aaacagaaat ccaagtcttt attcttcaaa taccaccagt gctttagagt   480

ttggcacttg gcctctccta atcttgtact taaatcctga catgtttatt ttgcatttta   540

aaagccaacc gctttataaa atgctttgac ctactttttt gtttttata agcctccatt    600

ttatacccta tgaaatgatg ataaaagcag tgccaaactt actgaattat tatgagaatt   660

aaataagata atacatgtca ggcat                                          685


<210>   33
<211>   484
<212>   DNA
<213>   Homo sapiens
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<400> 33

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cttcctccct gtcactttct tcctcctccc aactgcgaaa cagccttttc atttcttaaa     180

catttgtggc tccagaaggc aaatcggttt cttccctcct gcccttctgt ttggtattta     240

aaaacacacc ctgagaggca taaatgcaga tttttttttt cctccagtga attttctgta     300

accatgggcc tcgctttaag aagactcaac agataacaag tgtaaatgcc gaaaacatca     360

acgaaaggca gagggccaaa gggaagggtg atggttttac taaaaggtct tttttcttta     420

tttttaaaaa ttcaatgtgc atttccttag tggtggttat ccttttgtgc tcataaaatg     480

tgat                                                                  484
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<210> 34
<211> 449
<212> DNA
<213> Homo sapiens

<400> 34

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atttccctgt tctcttcttt cttcctgctg ctgagttaac tgggtaaaca gaggtggtgg      60

tagaatctta gcttcatagg tcatccatta gctgtatcca aaggcaacta caatcccatg     120

agactccctg cagacctacg tggtgtttgt agaatgatct tggttattta taccactgag     180

tatttgagac tgattgtcac atcactataa cctacttaca ctgtttgaaa cagacattgt     240

caattcaaaa caaacaatag aaaaccaaac aaaaaacaga tcaggaaag aataaacaac     300

aacaaagaga agatgatttg ctggtcaaaa cgggtggtga atagagattt tccactgaat     360

atgagacaca tgaataagaa atgaaggtga gggagatagc aatgaaaata tttggggaaa     420

gacagtccag actgaggaaa tagcctatg                                       449
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<210> 35
<211> 579
<212> DNA
<213> Homo sapiens

<400> 35

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gaacttcttg aggtagggtt acctgatgca cccctgggtt gtcagtgcac agggaggtag     120

gcagggcagt gactgaagca caggaagcag tgacactcat cagccatcat caaatggaat     180

aacataagcg gctgatcgaa actagctgga aggaaattgc agtcataata tctgtaagca     240

tgttgggttt ttttttttaat gttctgccct ttacacctat cattttatga acatttctct     300

ataccagggg ttggcaaact ttttcggtaa aaggtaagat aataaatatt tcaagctttg     360

tgggctattt ggtgtgtgtc ccgaatcctc aatcccgcca ttgcaatgaa aagcagccat     420

aaatgagtga tcatggctgt gttccaataa aactttatct aagaaacaag tggcaggctg     480

aaagtgctga cccctagttt acatcattag atcttctata aaaatggcta taagatattc     540
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caggctgtga atattttatg gtatatttca caaattctc                              579
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<210>  36
<211>  683
<212>  DNA
<213>  Homo sapiens

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gctctagaag cggtggccat aggcagtact tgtgtcaccc cactgccagc tccaggtggc     120

tcaaaacagt aaagtaaaga gagactgttt agaagaaagt aagaagagaa aacaagtact     180

ctttgccttg taaatcagag aattcttcca gatcttgtgg aagaccatca aggcagtact     240

tccatgagtc tgcaagaaac cacagcatta gtgggcttag ggtgcccct aaagcagata     300

caacttagat cataacaccc aagtcctttt gaatatctga aaagccttcc caagaagaat     360

gggaacaaac aagcccagac tataaagact acaataaata cctaattatt caatgcctgg     420

gcacagacag acatttacaa gtatcaagat catccaggaa aacatgacct caccaaatga     480

actaaataag gcaacagaga tcaatcctgg agaaacagag atatgtggcc tttcagacag     540

agaattcaaa attcagacag agaatttgaa gagtattttt gccagatata ctactctagg     600

ataaaaggtt ttttttttt ttcttcttca gcatgttaaa tatatcatgc cattctcttc     660

tggcttataa ggtttccact aaa                                              683
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<211>  643
<212>  DNA
<213>  Homo sapiens

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aaagccagac tgtgagaaac tacatgtcaa agggcctggg ttcctcaaca gataaaattgt    120

caggaaaaga aagggacaga ggggaaatct gtggattatg agtttaaaag aaataaactt     180

caaaaattag caagtctaag ttacagtagc tagggattct ggtatgtggg aagcaatata     240

ggcaatggaa agcaagatat tacttgcaag tagacacata atttctgcta acattctatt     300

gaccaaaacc aggtcacatg gccacatctg tccagctcca gctgaggcct gtgaatgtct     360

ctagctaggt agccaagtgc cttgaataaa tgtgaaggtt tgattatcaa aagaagagac     420

agtagataat ggtgaatact tattagtctc tgccactccc ttaaaaatgg aatacacaaa     480

ctcgcactgt gatttctaac ttacactgta cagcttctct gaattattct ggaacttaaa     540

tttgtgcttg tctttacttg ttattcagaa agtatctaga gcctctcttg attttcttta     600

ttttctccct gacagcatca ggaaagtcag aatctcaatc aag                       643
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<210>  38
<211>  385
<212>  DNA
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<213> Homo sapiens

<400> 38
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tatgtagttt tccaaaatat tctattttta aatgcactga ctttattttt atatcataga     120

tacatttata tataaagtat ttcaagatga atttgagaca aattgaagta acaaagcttg     180

atttccattc tgcatacaat attctctata attacaatgt aggttttggc cacttgtttt     240

gactaacata gctatgccat catttaaata tctgtatgcc tttgttttct gtaaattaaa     300

attcagacat acaaagaaat ataaggagag ttaggagaac agtgataaaa gataaaatgg     360

caccacagta attcctaaat aaggg                                          385
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<210> 39
<211> 655
<212> DNA
<213> Homo sapiens

<400> 39
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tcaatgagta cataggaact aatttataca gtaattccag tagtcataga gctctaaaaa      60

tcaacctctc ctcaacacta aactctaatg ctgttctcct gacatgttca taggtaacaa     120

aagagaaagc tctgttttgt cttccagttc tatctgccgg aattccaaag agtgctccac     180

ttcgttatat aatgctgcta cataggtctc agaaatcttt tggtttgaa gagggaaaaa     240

tttgaaatta aatatagata aaactgaacc atattcagat caatatgatc ttagaaccta     300

tagattttg cctgtattat ctacactgag actgaatagc atacatattt tgttcagtgg     360

gtattaatgg ttccatgatt ctaattttgc tcattttct ggcatgtatt ggctacctgc     420

cctacttttg cagttgacca attttgctta taaagaccag gctgtaatgt ggccttggtc     480

ccatcatacc atacctaacc ccgctgtatc tgatattagg ttcctaaata aataaaaata     540

aaactttact atttactcac taactctaaa aatgccttct cttctagttt actatacccca    600

cacagagaaa aaccatagat attttataat atagtttaga tgctaagtgg caata          655
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<210> 40
<211> 663
<212> DNA
<213> Homo sapiens

<400> 40
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tttgaaggcc attggtgtat gctgtggatg cgtcagttgg tttctttgct tcgtccatgc     120

taccttctca aggaatcagt tctctcccac tgattttggc agtggcagct caatgtgctc     180

tatgatccca gctcaaccga agacacctag ataagggtga acatctaacc caagagaaag     240

gaatatatga acaacctgag ccaatcatcc catcctgagg agaggtccaa aagacatccc     300

ctgaggttat gtgcaattgt gggctacagc tgtaagaaca taagaagcac tagccagtcc     360

ccaagagatg gagagaagcc cagtgaagct gtttatgcgc aaagagagtg attttgagtt     420
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ctaaatttcc aactctagtc cttatgtggc caagctctta ttgctgaccc gtggatatgt      480

gagagattgc ctgcagtgtc tgtgtttta tttgcaataa atttcttaag catgctagag      540

taggttcagt tccttgttac caactgctct ctcaccaagg cagactcttg gggagtgata      600

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gtg                                                                     663


<210>   41
<211>   551
<212>   DNA
<213>   Homo sapiens

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tgtgatggtg gcggcaaccc atctggaaca gctgctgtga ggaaaccagc tgcagcaagg      120

gaggtgtgcc tggggctgca tgctcatgga tcctgcagga gccagaaatt ggtgatccca      180

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agtgcagagc gaagttgtgg ccaagcccag gtgctatcac agcctagcca gatgtgcatt      420

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aacaacaagc atgcgaggga ggccaggggg ctgaggcagc ttggcacagg cctgtgggca      540

cccctcagca t                                                           551


<210>   42
<211>   625
<212>   DNA
<213>   Homo sapiens

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aggtattaat tcttcccatg gtccacatga ggaaacaggc acaggagaag ctaaataaca      120

agcccaagta gaggcttaga gcaagaaagg ccctagccca ttccatagac gtccacaaag      180

gaggaaaccg agtcccagag acagtggagc ctctccagat tcagtgtgac ccgacagggc      240

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cctgcggctg gcccagagcc cgcgggagag ctcggagcta gagctagagg ggagcacatg      480

ggagaggact cggaggcaga ggtcaggggc agaggcctgg gaacagacac acgggccgcg      540

ccacccccgc gccccgccct tgtaccccgc ccggcccagc tcccttgccc cgggatgtac      600

agcacctgcc cgggcccgct gcgca                                            625
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<212> DNA
<213> Homo sapiens

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ataaatatta tgcttcattt atagttgttt acttcccttt tgaggaaaac aacatgagtt   180

ttgcatcccc tccaaaaact catgttgaaa tttagttggc attgggaatg gtattaagag   240

atggagacat taaaaggtga gtaggccatg agaacactaa cttcatacat ggattaatgt   300

tattggggaa gtgggattat catgagagta caatccggta taaaagcgag cttggccctt   360

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caagaagacc ctcaccacat atgggcccct cactcttatg cttcc   465

<210> 44
<211> 546
<212> DNA
<213> Homo sapiens

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ggtacaggaa tgacaggagc aaagtcctct caaggagatc ttgcctgaca tgcttgagaa   120

agagcaaagg caaactagtg atggtgccat gaaagcctgt ctattaagac cactactact   180

ccttcctgct tgacacctca ccactcacac cccttttttc tataccaagg gttgaccagg   240

gccagttcca gcctactacc tgttttattg gaacaaaacc atgctcattt gtttacttgt   300

tgtttatggg agttcttatg ctacaacaag agttgaatat tactgcagag actgtatcgc   360

cctcaaagag cctaaaatat gtaccatctg gcccttagca gaaaacgttt gctaaccact   420

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tgctttggac atctttataa taatgaaata tgcattttcc atgttaaaat ctcgttactg   540

atggta   546

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<211> 688
<212> DNA
<213> Homo sapiens

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ttcacactct tcagtgttag ttgtgcaaag tccctctggc catggcagtg agcggttggg   120

ctgtgccgcc aaactctccg tatcaatctg gcctgggact caaccaagtg atctctgact   180

tttggaaaga gtctgtcttc agagttcacc cagaagatgg cttaattaga catctccctg   240

agctgttagg ccttagacgg gtgggagtcc tgccctgccc aagctagctc aaggacgagg   300

cccgcctgga ctcagcttgg agccacgtga tgggcgtgag tgtgtgagct cctggtaagg   360

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cgcagaggtc agatggagac cttgcatcct gcccgagaag tgccccaccc cctccaatat    420

ctggcttttc tctgcataca aaccaagctg aaaacagtcc actacccacc acccctcata    480

gctatggaac caaataaccc agaaattaaa agcttcactg tagctgtcct tttccccatt    540

tcctaaatgg aatttaaaaa gctctggctt gtcaaaaggg gaagattatt ttctgaattg    600

gaagtctgta gatatattga gcaacagcca ccctctctgg gtccctgcaa atggtaccca    660

tttttccaac ccacagctct agctgctc                                       688
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<210>    46
<211>    663
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<213>    Homo sapiens

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tgttaattga agtactactt actacctccc agtgtagctg ctcaccatcc atctttgaca    120

cccaaatgga tgaacacgta ttgcagaaga gacagtccgc agctaagtgt gacatcctta    180

gcctccaaat ggacaaacaa gtaaaaaaaa tgttttcttc ctgccccaag actctacaaa    240

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cagggtgatt tattctatca tctctccctg gaataaatcc tatgatggag agggaaaact    360

gcctcacaat ggctttttaat ttgggaacct gataatagaa aggattggac ctctgtctat    420

tctgtttcaa actatggtca ttggtagtca tatagagctg ggagtaaggg gttagggaag    480

agtaattctg caactcctgt ggtgctccta aagatgaggg acaacaatca accctatagg    540

aaagacctgg aaggactgaa attgggctga aaaatctgaa taagcctgga taaaggacct    600

ggtagggtgg agaataacct aaggacctga ttatcaaagc tagggcaaaa atcttgaaca    660

tct                                                                   663
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<211>    703
<212>    DNA
<213>    Homo sapiens

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gatatgtcac attttctgac ctaggtactc gcactttagc aaaaacaaaa acaaaaacaa     60

aacaaaaaaa acatcaaggt tcctgagcaa gagaacttta cacatagtgg ggactgggaa    120

agagtagagg caaggacctg gaaggaagcc acttacagca gatgcagagg tcccactagg    180

caggaatgta aaggaggggt tggatgaaac acagttaacg tataaaggtt aagagattac    240

aaattcaggc tggagggtag aaggaagaag tgaaactgac tcaggttctc agagtgggag    300

aatggtgata ctgtgctcta agactgaaaa tcagaaagaa gaataaattt aggggagtgg    360

gaggggagaa ggaagtgtaa aattatgaat ttagttttct atttgttgag tgtaaggtac    420

tcattgaaaa tctaaaagat gtgtagaaat cctaatagtt gatccagaga gtccgcatag    480
```

```
tgacacaaat tttaacaata atgctaattt ctactgagtg gaggtctacc atgtgtcagg        540

tatgctatgt tcaatttcat tgagtcctaa caaggatcct ataaagtagg tatgattgcg        600

tccatttcac agatgaggaa gtggaggctc tgaaatgtta cataacctgc ccagggtcac        660

aggtatctga ctctggccat tatgctcttt ctactgtgcc cta                         703
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```
<210>   48
<211>   682
<212>   DNA
<213>   Homo sapiens

<400>   48
ctctgtccca acttcctggt ggctttgttt acaccatgat ggaaaaactg cctactccag         60

tctcagtaat ggcaaatgtc cctcccacca ccaagctcga gcatcccagt attgacttca        120

gactgctgtg ctggcagcaa gaatttcaag ccagtggatc ttagcttgct tggctccatt        180

ggggcaggat ccactgagct agaccacttg gctccctagc ttcagccccc tttccagggg        240

agtgaacggt ctgcctccc tggcattcca ggcaccactg aggtttgaaa aaaaaaaaaa        300

tctcctgcag ctagctcggc atctgcccaa atggctgccc agttttgtgc ttgaaatcta        360

ggtccctggt ggtgtaggca cctgagggaa tctgctggtc tgtgggttgt gaagaccatg        420

ggaaaagggt agtatctggg ctggaatgca ctgttcctca tggcagagtc cctcagggct        480

tcttttggct aggggaggga gttccctgac cccttgccct tcccagggga catggcactc        540

caccctgctt ccacttgccc tctgtgggct gcacccagtg tctaaccagt cccaatgaga        600

tgagctggtt acctcagttg gaaatgcaga agtcattcac cttctgcatt gatcttgttg        660

ggagctgcaa agtggagctg tt                                                 682
```

```
<210>   49
<211>   633
<212>   DNA
<213>   Homo sapiens

<400>   49
cctgccacat cagcgtttat catcttcctg agtctctgag ggagacagca ctggaactca         60

ggatttggct cacctgtgac aaaggaaatg cgaggaggta acaaggcact gcaagaagga        120

agcatagtac aaggattctg aatcactttg ttcaaaattg gatatagagt aaataacagt        180

attttaagat gtttgctaaa aatcaagtaa atgcaaacag aataattgat gagatgccat        240

tatcactttc aaaatggcat cgattaaaaa aataagcact cagaaggttg gtgagtgggc        300

aacagaaggg acgtgtgccc accccacagc gggatgttga gttagcccct ggctttagaa        360

ggcagttggc agggagccgc agaggaggca tgtgtgcaga gctacgtctc ggatctagtc        420

tgcgggcatt accagagatg tgtccagaga gttctacaga gagctgtctt ttacatgagg        480

gaaactatga tgtgaagttt ttaaaagtcc aaaaataaga agtggatcag ataaataatg        540

gcacatctga gtcgtataaa ctatgaaatc accaaagtct tgtttaataa aactaatacc        600

tgggggtaaa gcaacttata agacaatagg cct                                     633
```

<210> 50
<211> 446
<212> DNA
<213> Homo sapiens

<400> 50
tctcccttct ccctcaaacc ggatccagcc ctcctgcacc ccggcctgtg tgcagccgca   60

gggagaggag taagccagcc tctcgcgtgc ggtgctctct gcataggttt agtggtgggg   120

accaacacgc gagctggcgc tttccgtgcg agcccagcat caggcggagg cccagggcca   180

accggactct gaacaaaggg agccgacaaa tgagaaagca aaggtacctc agagactacg   240

aagcccttca gatggaaatg gtcatctccc aacagcctct ctggacctct gcctgcaagc   300

ccggcccaca catcttggac ccaggctgga gacacagaca gccaggtggt gatgcccacg   360

cgcagctcca agaccccggg gagcctccgc caggccggaa cctgcgccag gcttctctgg   420

aaccttctct ccaggacgct cttctg   446

<210> 51
<211> 638
<212> DNA
<213> Homo sapiens

<400> 51
taattctccc atttatccat tcaataagtt gtcactgaca tctacataat gacaggacag   60

gcgtggctcc agggagctta gggtcaagtg ggtctgacct gaaaatctac ataaactctg   120

tcttctactc cataatatat tgatgcttct tttaatataa aattttctt tctccatcca   180

tttgcaaata aaattagtcc cccaggaaga taagtcagac ttctctgtgg cttctcaagt   240

gccagctggg catgagcatc tcagactgag acgcctggac aacctcctgt tcaaatgtgg   300

ctttgtcata gaattggagc accctgaggg caggatgaca cccatctgga gtaagggact   360

ccagcatgac cacccacaat ggcagatgtg cctacctggc aaccacgccc atcccacccc   420

acactgcttc tctgcccaca cagccccaat ctgttcagac agccagtgga ggtaggacca   480

tctcctgcct cggggcatga atcattgctg ggctggggca gtcaaacagc ctcacctgcc   540

ctggctgact ctggccaatg agatggaagg ggaagttggc ttgggagcag gtgggaatat   600

cctctcaaac aaagagcttt cagctcctcc tcccttgc   638

<210> 52
<211> 707
<212> DNA
<213> Homo sapiens

<400> 52
tttatttttt ccagggcggg ggagttgaag taggaagaag agtaatgaag aatgtgtttg   60

ccttaaaagc ataagcagag ttattttaa tgtaagtgcc ctcccctttt tgtaatgcca   120

ggggcagagt attctccaaa tgccttatac acttactttc agcactaaat gtatttgtgc   180

aaatcccatg aatcatcaag gcttttgaaa atatttatag ggagagaaac tcaaccctttt   240

```
tcattagagt gagtaaaact cacactggta tcttgctatt gtttaaggag aacaatggat      300

gggtggatga aagagaatgt cagctggatc aacaaacagc tgttccaaca gaagtcctgc      360

tatcctatac aataaagcag tattaattgc tgccttccct ggagtctcta aagatactcg      420

gtaagtgtac agtaccctga tgaactaaag ccaaaagtta gggctgattt cgggcttcat      480

cacagtgaac acctcacctc cagagagaaa gttgtaggcc tttaaagctt ttgatctcag      540

agaagactcc accgcctttc aaggcaataa attcttgcct cttctccaaa tactctaact      600

gaaacttctg ctgttgcagt ataattcaat gtgttttttt ccagacttca atgaaagcaa      660

gaattctcat tctgcatgta attatatccc ttataatacc cacagcc                   707
```

```
<210>  53
<211>  654
<212>  DNA
<213>  Homo sapiens

<400>  53
tatgagtgat gcaaatatca caaatactgg tggcaccaaa acgatgattt ttctgaaatc       60

tgaaataaac ttggtaaaat ttcatttgaa acaaaagtct cctttcaatt tattaagtac      120

agcgagtgct cacctaaggt cttggaaatg gcaactttaa gtaaaataat gtatattaaa      180

accaattttc ccataagcta attgatctaa acaagagtta tgcttttatg gcatatttct      240

ggtcacaaaa acatcaccaa acttctaaag aaagaccaaa atatttctga tattaaacat      300

ttaaagaaat gtgagctata cgtacattta agaaaggtta ataaaaacaa gtcagataat      360

tatttaccca attattccag ttcaggatac tgggtagcca aagcttatct gggcagctta      420

ggatgcaagg aaggaactca ccttgaacag gaaaccaatt ccatcacagg gcacattcac      480

acacagaccc acactcactt cagaccagga aaatttaaac accaattcac ctactatgca      540

catctttgga atgtgggatg aagccagcgt acctggagaa aacccaggaa gacatgggga      600

gaatgggcaa actccacaca gacagaggcc ctagtgaagt atcattatta ttct            654
```

```
<210>  54
<211>  775
<212>  DNA
<213>  Homo sapiens

<400>  54
cccaatatgg atgcaagggt cactgattac tttagggtcc ttatgttgca aggagtctag       60

gaaaaacttc aatttttttt ttttacagca acgtgattct ctttgtggtg tctactaaaa      120

taagaaagtt acagtgagat ttcttcagtg ttctgatggc tttctgcctc tcctctgacc      180

agcgtgagcc actccttcat ctctgcctct cactttctgc ttgacagtca aggctcgcct      240

tgaacctccc tcttcagaaa gcctttctga cctgcctcct caggagtgtt tgtttgtggt      300

atttgaccac aatctgcact atactaatta gctatgattt ttatggggct ggaggaactt      360

ctaaggcagc agccgcgtcg ggttcttctg tctccttccc agggcttcct cagggcttag      420
```

```
tacagggcat gtgctaagca ttccctagcc ccttcctttg cccttgtttg ttctttctaa       480

tcagattctg tggggggaagt tcattgtcac aatgtccaat gtttagcatt caaaggctgc       540

atgaggtaga tcaggtaaac atacctctct ggctgtacca aaatgggggg gtttggcata       600

tccgccacct gaaagcagct ggaccctgcg tggatctggg tttgtatgct gtgagtaatg       660

ctgtctgcat cttcgaatct ttcactgtaa gaaacaaaag tctgacagcc tctgaatccc       720

gccctccttc ctgatacact gtgacaatgt gtttatagta ccctgttgat gctga          775


<210>   55
<211>   224
<212>   DNA
<213>   Homo sapiens

<400>   55
aaaaaaaaaa aaaaaaaggt gactgatatt accaaatagc ctccatgatg taccaattta        60

cactgcttat aggtttgtct gttttcttga tattatacac tctgtcttac agactcacag       120

caacatgtct tggaattcca cttatgtcaa tatacataga tctaccttat taaaaaaaaa       180

aaacatgccg ggcatagggg cttacacctg taatcccagc actt                       224


<210>   56
<211>   465
<212>   DNA
<213>   Homo sapiens

<400>   56
caccatcctc cagaccccag aatggtagat ccatccaagc ttgcaccctg cacctgggaa        60

aagccatagg acactcaaca tcagccatga aggcagcccg gaaggggggct atgccctgca       120

aagccacagg ggaggagcta cccaaggcca tgggagccca cctcttgcat cagtgtgacc       180

tggacgtgaa acatggagtc caaggagatc attttggagc tttaagattt ggctgctcca       240

ctggatttca gatttgcatg gggcctgtag cctctttgtt ttggctaatt tctcctattt       300

ggaatggttg tatttcccca atgcctgtac tcccattgta tctaggaagt ataataggta       360

cgtgcttttg attgtaaagg cttataggca aaagggactt gccttgtctc agatgagact       420

ttgaactcag actgttgagt taatgctgga atgagttaag atttt                      465


<210>   57
<211>   621
<212>   DNA
<213>   Homo sapiens

<400>   57
cgcttggatg gacaggttac cactggagtg ctacggctct gatacctgca gttttgcaga        60

accagcctgc aatggcgagg ccgggggcctt tggtttagca cagaggtgcg agtgtgcggc       120

ccactctgag gggcagcggt acctatgtcc tcccctttcc tcccactgca gactcccagg       180

gcctggagat ggtgactgga acaaatgaca catttcagcc acacaaggag gcctctgtga       240

ggccgcttct tccagcagaa gctcctgtgg atgtgcatgt gtcagaacaa acccagccca       300
```

```
ggaccgaatg gatttgggtt atttgctttt caattctggc cccattctgt gggaggccat    360

ctgtgatgag gcagggaaaa gcagacagag aaagggatc catgctcttg catccagccc    420

ttccaagaaa attctatgag agcagcacct gaaccgcaag gccccgttgg gacagcagat    480

tgtattttag gatttaacc acaaatcatc tctcctgact tctcattctc tgcctcgcaa    540

cacttctttc tcatttcttc cacctagaat ctctctattt ctacttgacc tttgcttttg    600

gatgtggcca ctcaaacctt t                                             621
```

<210> 58
<211> 24
<212> PRT
<213> Homo sapiens

<400> 58

```
Trp Asn Leu Glu Asp Asn Gly Gly Ile Asn Ala Phe Lys Ile Pro Ser
1               5                   10                  15

Glu Asn Tyr Phe Gln Pro Arg Ile
            20
```

<210> 59
<211> 27
<212> PRT
<213> Homo sapiens

<400> 59

```
Pro Ala Thr Ser Ser Ser Gln Leu Ile Ser Ile Glu Thr Glu Leu Ser
1               5                   10                  15

Leu Ala Gln Cys Ile Ser Val Val Ser Ala Glu
            20                  25
```

<210> 60
<211> 63
<212> PRT
<213> Homo sapiens

<400> 60

```
Thr Cys Ile Phe Leu Pro Val Leu Lys Leu Asn His Leu Phe Val Leu
1               5                   10                  15

Ile Phe Val Ser Leu Ser Pro Cys Pro Gln Pro Val Ala Thr Thr Ile
            20                  25                  30

Leu Leu Ser Val Ser Met Asn Leu Thr Thr Leu His Thr Ser Tyr Lys
        35                  40                  45

Trp Arg His Thr Val Phe Tyr Gly Phe Leu Glu Ala Gly Ile Phe
    50                  55                  60
```

<210> 61
<211> 64
<212> PRT
<213> Homo sapiens

<400> 61

```
Thr Ile Gly Gly Thr Leu Leu Gly Leu Ser Phe Leu Ile Cys Lys Ala
1               5                   10                  15
```

Leu Val Ile Leu Glu Ser Ser Ser His Phe Phe Val Asp Arg Arg Arg
        20   25   30

Gly Ser Gly Lys Lys Ala Tyr Ala Asn Lys Gln Pro Gln Gly Lys Pro
        35   40   45

Ala Ala Gly Ala Leu Pro Ser Trp Leu Arg Lys Leu Pro Leu Gly Arg
    50   55   60

<210>   62
<211>   50
<212>   PRT
<213>   Homo sapiens

<400>   62

Trp Lys Asn Trp Leu Phe Phe Thr Cys Leu His Cys Thr Thr Pro His
1   5   10   15

Asp Val Met Phe His Ile Leu Leu Lys Ile Pro Glu Phe His Glu Val
        20   25   30

Leu Gly Thr Cys His Ile Leu Gln Gly Leu Asn Lys Ile Val Phe Thr
        35   40   45

Leu Pro
    50

<210>   63
<211>   36
<212>   PRT
<213>   Homo sapiens

<400>   63

Thr Trp Thr Pro Asp Gly Glu Ser Val Leu Arg Asp Pro Glu Gly Trp
1   5   10   15

Glu His Trp Thr Pro Asp Gly Glu Ser Val Leu Arg Asp Pro Glu Gly
        20   25   30

Trp Glu His Trp
        35

<210>   64
<211>   45
<212>   PRT
<213>   Homo sapiens

<400>   64

Arg Gln Glu Ala Leu Leu His His Val Ala Thr Ile Ala Asn Thr Phe
1   5   10   15

Arg Ser His Arg Ala Ala Gln Arg Cys His Glu Asp Trp Lys Arg Leu
        20   25   30

Ala Arg Val Met Asp Arg Phe Phe Leu Ala Ile Phe Phe
        35   40   45

<210>   65
<211>   24
<212>   PRT
<213>   Homo sapiens

<400>   65

```
His Cys Gln Leu Ser Pro Leu Pro Pro Gly Ile Phe Ser Ile Ser Cys
1               5               10              15

Trp Leu Ser Lys Arg Trp Arg Pro
            20
```

<210> 66
<211> 36
<212> PRT
<213> Homo sapiens

<400> 66

```
Gln Ser Trp Leu Asp Thr Arg Leu Ala Trp Asn Thr Ser Ala His Pro
1               5               10              15

Arg His Ala Ile Thr Leu Pro Trp Glu Ser Leu Trp Thr Pro Arg Leu
            20              25              30

Thr Ile Leu Glu
        35
```

<210> 67
<211> 24
<212> PRT
<213> Homo sapiens

<400> 67

```
Trp Asn Leu Glu Asp Asn Gly Gly Ile Asn Ala Phe Lys Ile Pro Ser
1               5               10              15

Glu Asn Tyr Phe Gln Pro Arg Ile
            20
```

<210> 68
<211> 38
<212> PRT
<213> Homo sapiens

<400> 68

```
Cys Leu Ser Leu Met Val Gly Ser Leu Leu Glu Thr Ile Phe Ile Thr
1               5               10              15

His Leu Leu His Val Ala Thr Thr Gln Pro Pro Pro Leu Pro Arg Trp
            20              25              30

Leu His Ser Leu Leu Leu
        35
```

<210> 69
<211> 89
<212> PRT
<213> Homo sapiens

<400> 69

```
Gly Glu Thr Asp Val Ile Tyr Leu Leu Ile Ile Cys Arg Lys Ile Thr
1               5               10              15

Asn Ile Met Val Pro Cys Val Leu Ile Ser Gly Leu Val Leu Leu Ala
            20              25              30

Tyr Phe Leu Pro Ala Gln Ser Leu Gly Thr Ala Ala Pro Glu Ile Arg
        35              40              45
```

```
Cys Cys Gly Asp Ala Val Asn Phe Val Ala Lys Asn Met Arg Gly Gln
      50                  55                  60

Asp Thr Arg Gly Gln Asp Asp Gly Ile Cys Phe Trp Val Ala Arg Val
65                  70                  75                  80

Leu Phe Ser Leu Gly Ser Asn Leu Ile
                85
```

<210> 70
<211> 29
<212> PRT
<213> Homo sapiens

<400> 70

```
Asp Ser Thr Lys Ala Arg Pro Gln Lys Tyr Glu Gln Leu Leu His Ile
1               5                  10                  15

Glu Asp Asn Asp Phe Ala Met Arg Pro Gly Phe Gly Gly
              20                  25
```

<210> 71
<211> 40
<212> PRT
<213> Homo sapiens

<400> 71

```
Pro Asp Phe Arg Thr Asp Ser Phe Ser Val Arg Pro Thr Gln Ile Pro
1               5                  10                  15

Val Gly Asn Leu Pro Phe Pro Cys Ala Thr Glu Cys Lys Glu Asn Ser
              20                  25                  30

Pro Lys Thr Ser Leu Thr Thr Leu
          35                  40
```

<210> 72
<211> 50
<212> PRT
<213> Homo sapiens

<400> 72

```
Gly Asp Cys Arg Met Ala His Ala Glu Gln Lys Leu Met Asp Asp Leu
1               5                  10                  15

Leu Asn Lys Thr Cys Tyr Asn Asn Leu Ile Arg Pro Ala Thr Ser Ser
              20                  25                  30

Ser Gln Leu Ile Ser Ile Gln Thr Ala Leu Ser Leu Ala Gln Cys Ile
          35                  40                  45

Ser Val
    50
```

<210> 73
<211> 43
<212> PRT
<213> Homo sapiens

<400> 73

```
Ala Glu Gln Lys Leu Met Asp Asp Leu Leu Asn Lys Thr Arg Tyr His
1               5                  10                  15
```

```
Asn Leu Ile Arg Pro Ala Ala Ser Ser Ser Gln Leu Ile Ser Ile Glu
            20              25              30

Met Glu Leu Ser Leu Ala Gln Cys Ile Ser Val
        35              40
```

<210> 74
<211> 51
<212> PRT
<213> Homo sapiens

<400> 74

```
Arg Gly Thr Ala Ala Trp Pro Met Pro Ser Arg Lys Leu Met Asp Asp
1               5               10              15

Leu Leu Asn Lys Thr Cys Tyr Asn Asn Leu Ile Arg Pro Ala Thr Ser
            20              25              30

Ser Ser Gln Leu Ile Ser Ile Gln Thr Ala Leu Ser Leu Ala Gln Cys
        35              40              45

Ile Ser Val
        50
```

<210> 75
<211> 45
<212> PRT
<213> Homo sapiens

<400> 75

```
Gly Lys Phe Thr Cys Ile Glu Val Lys Phe His Leu Glu Arg Gln Met
1               5               10              15

Gly Tyr Tyr Leu Ile Gln Met Tyr Ile Pro Ser Leu Leu Ile Val Ile
            20              25              30

Leu Ser Trp Val Ser Leu Trp Ile Asn Met Asp Ala Ala
        35              40              45
```

<210> 76
<211> 50
<212> PRT
<213> Homo sapiens

<400> 76

```
Val Ser Tyr Val Lys Ala Ile Asp Ile Trp Met Ala Val Cys Leu Leu
1               5               10              15

Phe Val Phe Ala Ala Leu Leu Glu Tyr Ala Ala Ile Asn Phe Val Ser
            20              25              30

Arg Gln His Lys Glu Phe Ile Arg Leu Arg Arg Arg Gln Arg Arg Gln
        35              40              45

Arg Leu
    50
```

<210> 77
<211> 28
<212> PRT
<213> Homo sapiens

<400> 77

```
Arg Leu Thr Leu Ile Leu Ser Cys Leu Met Asp Leu Lys Asn Phe Pro
1               5                   10                  15

Met Asp Ile Gln Thr Cys Thr Met Gln Leu Glu Ser
            20              25
```

<210> 78
<211> 72
<212> PRT
<213> Homo sapiens

<400> 78

```
Ile Ser Leu Ser Ala Val Phe Leu Arg Gly Ser Leu Leu Lys Leu Trp
1               5                   10                  15

Leu Phe Ser Thr Gly Trp Tyr Asn Arg Leu Phe Ile Asn Phe Val Leu
            20              25                  30

Arg Arg His Val Phe Phe Phe Val Leu Gln Thr Tyr Phe Pro Ala Ile
        35              40                  45

Leu Met Val Met Leu Ser Trp Val Ser Phe Trp Ile Asp Arg Arg Ala
    50              55                  60

Val Pro Ala Arg Val Ser Leu Gly
65                  70
```

<210> 79
<211> 159
<212> PRT
<213> Homo sapiens

<400> 79

```
Arg Cys Arg Pro Ser Pro Tyr Val Val Asn Phe Leu Val Pro Ser Gly
1               5                   10                  15

Ile Leu Ile Ala Ile Asp Ala Leu Ser Phe Tyr Leu Pro Leu Glu Ser
            20              25                  30

Gly Asn Cys Ala Pro Phe Lys Met Thr Val Leu Leu Gly Tyr Ser Val
        35              40                  45

Phe Leu Leu Met Met Asn Asp Leu Leu Pro Ala Thr Ser Thr Ser Ser
    50              55                  60

His Ala Ser Leu Val Arg Pro His Pro Ser Arg Asp Gln Lys Arg Gly
65                  70                  75                  80

Val Cys Trp Met Gly Arg Gly Met Gly Arg Thr Arg Arg Ser Glu Lys
                85                  90                  95

Gly Ser Trp Lys Lys Ile Leu Trp Glu Arg Asn Lys Lys Phe Val Ala
            100                 105                 110

Pro Leu Ala Leu Met Gln Thr Pro Leu Pro Ala Gly Val Tyr Phe Ala
        115                 120                 125

Leu Cys Leu Ser Leu Met Val Gly Ser Leu Leu Glu Thr Ile Phe Ile
    130                 135                 140

Thr His Leu Leu Ala Arg Gly His His Pro Ala Pro Thr Ser Ala
145                 150                 155
```

<210> 80

```
<211>   60
<212>   PRT
<213>   Homo sapiens

<400>   80

Leu Ser Ser Ser Met Asp Val Asp Lys Thr Pro Lys Gly Leu Thr Ala
1               5                   10                  15

Tyr Val Ser Asn Glu Gly Arg Ile Arg Tyr Lys Lys Pro Met Lys Gly
            20                  25                  30

Asp Ser Ile Cys Asn Leu Asp Ile Phe Tyr Phe Pro Phe Asp Gln Gln
        35                  40                  45

Asn Cys Thr Leu Thr Phe Ser Ser Phe Leu Tyr Thr
    50                  55                  60

<210>   81
<211>   33
<212>   PRT
<213>   Homo sapiens

<400>   81

Gln Glu Trp Ser Asp Tyr Lys Leu Arg Trp Asn Pro Thr Asp Phe Gly
1               5                   10                  15

Asn Ile Thr Ser Leu Lys Val Pro Ser Glu Met Ile Trp Ile Pro Asp
            20                  25                  30

Ile

<210>   82
<211>   58
<212>   PRT
<213>   Homo sapiens

<400>   82

Cys Pro Gly Val Ile Arg Arg His His Gly Gly Ala Thr Asp Gly Pro
1               5                   10                  15

Arg Glu Thr Asp Val Ile Tyr Ser Leu Ile Ile Leu Arg Lys Pro Leu
            20                  25                  30

Phe Tyr Val Ile Asn Ile Ile Val Pro Cys Val Leu Ile Trp Gly Leu
        35                  40                  45

Val Leu Leu Ala Tyr Phe Leu Pro Ala Gln
    50                  55

<210>   83
<211>   43
<212>   PRT
<213>   Homo sapiens

<400>   83

Arg Phe Leu Ile Phe Val Met Val Val Ala Thr Leu Ile Val Met Asn
1               5                   10                  15

Cys Val Ile Val Leu Asn Val Ser Gln Arg Thr Pro Thr Thr His Ala
            20                  25                  30

Met Ser Pro Arg Leu Arg His Val Ser Ala Glu
```

35   40

<210>   84
<211>   92
<212>   PRT
<213>   Homo sapiens

<400>   84

His Pro Asp Ser Lys Tyr His Leu Lys Lys Arg Ile Thr Ser Leu Ser
1   5   10   15

Leu Pro Ile Val Ser Ser Ser Glu Ala Asn Lys Val Leu Thr Arg Ala
            20   25   30

Pro Ile Leu Gln Ser Thr Pro Val Thr Pro Pro Leu Ser Pro Ala
            35   40   45

Phe Gly Gly Thr Ser Lys Ile Asp Gln Tyr Ser Arg Ile Leu Phe Pro
        50   55   60

Val Ala Phe Ala Gly Phe Asn Leu Val Tyr Trp Gly Ser Phe Ile Phe
65   70   75   80

Pro Lys Ile Gln Trp Glu Val Ser Thr Ser Val Glu
                85   90

<210>   85
<211>   61
<212>   PRT
<213>   Homo sapiens

<400>   85

Arg Ser Val Gly Val Glu Thr Gly Glu Thr Lys Lys Glu Gly Ala Ala
1   5   10   15

Arg Ser Gly Gly Gln Gly Gly Ile Arg Ala Arg Leu Arg Pro Met Asp
            20   25   30

Ala Asp Thr Ile Asp Ile Asn Ala Arg Ala Val Phe Pro Ala Ala Phe
        35   40   45

Ala Ala Val Asn Val Ile Tyr Trp Ala Ala Tyr Ala Met
    50   55   60

<210>   86
<211>   132
<212>   PRT
<213>   Homo sapiens

<400>   86

Asn Cys Cys Glu Glu Ile Tyr Thr Asp Ile Thr Tyr Ser Phe Tyr Ile
1   5   10   15

Ile Arg Leu Pro Met Phe Tyr Thr Ile Asn Leu Ile Ile Pro Cys Leu
            20   25   30

Phe Ile Ser Phe Leu Thr Val Leu Val Phe Tyr Leu Pro Ser Asp Cys
        35   40   45

Gly Glu Lys Val Thr Leu Cys Ile Ser Val Leu Leu Ser Leu Thr Val
        50   55   60

Phe Leu Leu Val Ile Thr Thr Ile Pro Ser Thr Ser Leu Val Gly Pro
65   70   75   80

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```
Leu Val Gly Glu Tyr Leu Leu Phe Thr Met Ile Phe Gly Thr Leu Ala
                85                  90                  95

Ile Val Val Thr Val Phe Glu Leu Asn Ile His Tyr Arg Thr Pro Thr
            100                 105                 110

Thr His Thr Met Pro Arg Trp Val Lys Thr Val Phe Leu Lys Leu Leu
        115                 120                 125

Pro Gln Val Leu
    130
```

<210> 87
<211> 70
<212> PRT
<213> Homo sapiens

<400> 87

```
Ser Pro Thr His Asp Glu His Leu Leu His Gly Gly Gln Pro Pro Glu
1               5                   10                  15

Gly Asp Pro Asp Leu Ala Lys Ile Leu Glu Glu Val Arg Tyr Ile Ala
            20                  25                  30

Asn Arg Phe Arg Cys Gln Asp Glu Ser Glu Ala Val Cys Asn Glu Trp
            35                  40                  45

Lys Phe Pro Ala Cys Val Val Asp Arg Leu Cys Leu Met Ala Phe Ser
    50                  55                  60

Val Phe Thr Ile Ile Cys
65                  70
```

<210> 88
<211> 42
<212> PRT
<213> Homo sapiens

<400> 88

```
Glu Ile Thr Asp Thr Ser Arg Lys Val Ile Gln Thr Gln Gly Glu Trp
1               5                   10                  15

Glu Leu Leu Gly Ile Asn Lys Ala Thr Pro Lys Met Ser Met Gly Asn
            20                  25                  30

Asn Leu Tyr Asp Gln Ile Met Phe Tyr Val
        35                  40
```

<210> 89
<211> 38
<212> PRT
<213> Homo sapiens

<400> 89

```
Asp Leu Ser Cys Leu Leu Ile Cys Ser Ile Ile Ala Cys Leu Tyr Asn
1               5                   10                  15

Ile Asn Ile Ile Leu Pro Cys Leu Leu Arg Ser Leu Met Lys Val Ile
            20                  25                  30

Leu Phe Ile Leu Ala Ser
        35
```

```
<210>  90
<211>  60
<212>  PRT
<213>  Homo sapiens

<400>  90

Phe Phe Ile Leu Leu Glu Asp Phe Ser Val Ser Ser Glu His Gly Leu
1               5                   10                  15

Ile Leu Gly Lys His Ser Ser Arg Ser Phe Met Pro Arg Phe Cys Ser
            20                  25                  30

Phe Ile Cys Arg Leu Leu Pro Pro Cys His Phe Leu Pro Pro Pro Asn
        35                  40                  45

Cys Glu Thr Ala Phe Ser Phe Leu Lys His Leu Trp
    50                  55                  60

<210>  91
<211>  37
<212>  PRT
<213>  Homo sapiens

<400>  91

Gly Tyr Phe Leu Ser Leu Asp Cys Leu Ser Pro Asn Ile Phe Ile Ala
1               5                   10                  15

Ile Ser Leu Thr Phe Ile Ser Tyr Ser Cys Val Ser Tyr Ser Val Glu
            20                  25                  30

Asn Leu Tyr Ser Pro
            35

<210>  92
<211>  30
<212>  PRT
<213>  Homo sapiens

<400>  92

Phe Leu Asp Lys Val Leu Leu Glu His Ser His Asp His Ser Phe Met
1               5                   10                  15

Ala Ala Phe His Cys Asn Gly Gly Ile Glu Asp Ser Gly His
            20                  25                  30

<210>  93
<211>  29
<212>  PRT
<213>  Homo sapiens

<400>  93

Ser Pro Gly Leu Ile Ser Val Ala Leu Phe Ser Ser Phe Gly Glu Val
1               5                   10                  15

Met Phe Ser Trp Met Ile Leu Ile Leu Val Asn Val Cys
            20                  25

<210>  94
<211>  31
<212>  PRT
<213>  Homo sapiens

<400>  94
```

```
Leu Ser Lys Glu Glu Thr Val Asp Asn Gly Glu Tyr Leu Leu Val Ser
1               5               10              15

Ala Thr Pro Leu Lys Met Glu Tyr Thr Asn Ser His Cys Asp Phe
            20              25              30
```

<210> 95
<211> 18
<212> PRT
<213> Homo sapiens

<400> 95

```
Trp Cys His Phe Ile Phe Tyr His Cys Ser Pro Asn Ser Pro Tyr Ile
1               5               10              15

Ser Leu
```

<210> 96
<211> 44
<212> PRT
<213> Homo sapiens

<400> 96

```
Ile Phe Asn Phe Lys Phe Phe Pro Leu Gln Asn Gln Lys Ile Ser Glu
1               5               10              15

Thr Tyr Val Ala Ala Leu Tyr Asn Glu Val Glu His Ser Leu Glu Phe
            20              25              30

Arg Gln Ile Glu Leu Glu Asp Lys Thr Glu Leu Ser
            35              40
```

<210> 97
<211> 43
<212> PRT
<213> Homo sapiens

<400> 97

```
Phe Leu Cys Ser Tyr Ser Cys Ser Pro Gln Leu His Ile Thr Ser Gly
1               5               10              15

Asp Val Phe Trp Thr Ser Pro Gln Asp Gly Met Ile Gly Ser Gly Cys
            20              25              30

Ser Tyr Ile Pro Phe Ser Trp Val Arg Cys Ser
            35              40
```

<210> 98
<211> 93
<212> PRT
<213> Homo sapiens

<400> 98

```
Gly His Ser Cys Ser Cys Pro Thr Val Ala Pro Asp Leu Gly Ile Ser
1               5               10              15

Ala Leu Leu Gly Ala Gln Glu Val Pro Cys Pro His Trp Leu Arg Ile
            20              25              30

Gly Cys Ser Cys Pro Trp Ala Val Pro Ala Pro Val Gln Ser Glu Val
            35              40              45
```

```
Val Ala Lys Pro Arg Cys Tyr His Ser Leu Ala Arg Cys Ala Phe Ile
    50              55              60

Trp Gly Val Leu Thr His Gln Pro Pro Ala Thr Ser Ala Leu Ser Gly
65              70              75              80

Leu Trp Ala Thr Thr Ser Met Arg Gly Arg Pro Gly Gly
                85              90
```

```
<210>  99
<211>  67
<212>  PRT
<213>  Homo sapiens

<400>  99
```

```
Tyr Leu Arg Leu Ala Gln Ser Pro Arg Glu Ser Ser Glu Leu Glu Leu
1               5               10              15

Glu Gly Ser Thr Trp Glu Arg Thr Arg Arg Gln Arg Ser Gly Ala Glu
            20              25              30

Ala Trp Glu Gln Thr His Gly Pro Arg His Pro Arg Ala Pro Pro Leu
        35              40              45

Tyr Pro Ala Arg Pro Ser Ser Leu Ala Pro Gly Cys Thr Ala Pro Ala
    50              55              60

Arg Ala Arg
65
```

```
<210>  100
<211>  32
<212>  PRT
<213>  Homo sapiens

<400>  100
```

```
Pro Ala Val Phe His Lys Tyr Tyr Ala Ser Phe Ile Val Val Tyr Phe
1               5               10              15

Pro Phe Glu Glu Asn Asn Met Ser Phe Ala Ser Pro Pro Lys Thr His
            20              25              30
```

```
<210>  101
<211>  20
<212>  PRT
<213>  Homo sapiens

<400>  101
```

```
Cys Thr Trp Ile Glu Pro Ser Ser Asp Met Pro Gln Phe Thr Leu Leu
1               5               10              15

Asn Thr Ser Trp
            20
```

```
<210>  102
<211>  43
<212>  PRT
<213>  Homo sapiens

<400>  102
```

```
Pro Gly Lys Ala Gln Arg Ser Asp Gly Asp Leu Ala Ser Cys Pro Arg
1               5               10              15
```

```
Ser Ala Pro Pro Pro Pro Ile Ser Gly Phe Ser Leu His Thr Asn Gln
            20          25              30

Ala Glu Asn Ser Pro Leu Pro Thr Thr Pro His
        35              40
```

<210> 103
<211> 66
<212> PRT
<213> Homo sapiens

<400> 103

```
Pro Pro Tyr Gln Val Leu Tyr Pro Gly Leu Phe Arg Phe Phe Ser Pro
1           5               10              15

Ile Ser Val Leu Pro Gly Leu Ser Tyr Arg Val Asp Cys Cys Pro Ser
            20          25              30

Ser Leu Gly Ala Pro Gln Glu Leu Gln Asn Tyr Ser Ser Leu Thr Pro
        35              40              45

Tyr Ser Gln Leu Tyr Met Thr Thr Asn Asp His Ser Leu Lys Gln Asn
    50              55              60

Arg Gln
65
```

<210> 104
<211> 28
<212> PRT
<213> Homo sapiens

<400> 104

```
Pro Glu Gln Glu Asn Phe Thr His Ser Gly Asp Trp Glu Arg Val Glu
1           5               10              15

Ala Arg Thr Trp Lys Glu Ala Thr Tyr Ser Arg Cys
            20          25
```

<210> 105
<211> 90
<212> PRT
<213> Homo sapiens

<400> 105

```
Ser Ala Phe Pro Thr Glu Val Thr Ser Ser Ser His Trp Asp Trp Leu
1           5               10              15

Asp Thr Gly Cys Ser Pro Gln Arg Ala Ser Gly Ser Arg Val Glu Cys
            20          25              30

His Val Pro Trp Glu Gly Gln Gly Val Arg Glu Leu Pro Pro Leu Ala
        35              40              45

Lys Arg Ser Pro Glu Gly Leu Cys His Glu Glu Gln Cys Ile Pro Ala
    50              55              60

Gln Ile Leu Pro Phe Ser His Gly Leu His Asn Pro Gln Thr Ser Arg
65              70              75              80

Phe Pro Gln Val Pro Thr Pro Pro Gly Thr
                85              90
```

```
<210>  106
<211>  37
<212>  PRT
<213>  Homo sapiens

<400>  106

Trp His Leu Ile Asn Tyr Ser Val Cys Ile Tyr Leu Ile Phe Ser Lys
1               5                   10                  15

His Leu Lys Ile Leu Leu Phe Thr Leu Tyr Pro Ile Leu Asn Lys Val
            20                  25                  30

Ile Gln Asn Pro Cys
            35

<210>  107
<211>  34
<212>  PRT
<213>  Homo sapiens

<400>  107

Arg Lys Ala Pro Ala Arg Val Leu Val Pro Thr Thr Lys Pro Met Gln
1               5                   10                  15

Arg Ala Pro His Ala Arg Gly Trp Leu Thr Pro Leu Pro Ala Ala Ala
            20                  25                  30

His Arg

<210>  108
<211>  68
<212>  PRT
<213>  Homo sapiens

<400>  108

Phe Val Ile Glu Leu Glu His Pro Glu Gly Arg Met Thr Pro Ile Trp
1               5                   10                  15

Ser Lys Gly Leu Gln His Asp His Pro Gln Trp Gln Met Cys Leu Pro
            20                  25                  30

Gly Asn His Ala His Pro Thr Pro His Cys Phe Ser Ala His Thr Ala
            35                  40                  45

Pro Ile Cys Ser Asp Ser Gln Trp Arg Asp His Leu Leu Pro Arg Gly
    50                  55                  60

Met Asn His Cys
65

<210>  109
<211>  36
<212>  PRT
<213>  Homo sapiens

<400>  109

Leu Leu Phe Lys Glu Asn Asn Gly Trp Val Asp Glu Arg Glu Cys Gln
1               5                   10                  15

Leu Asp Gln Gln Thr Ala Val Pro Thr Glu Val Leu Leu Ser Tyr Thr
            20                  25                  30
```

Ile Lys Gln Tyr
        35

<210>   110
<211>   41
<212>   PRT
<213>   Homo sapiens

<400>   110

Trp Asn Trp Phe Pro Val Gln Gly Glu Phe Leu Pro Cys Ile Leu Ser
1   5   10   15

Cys Pro Asp Lys Leu Trp Leu Pro Ser Ile Leu Asn Trp Asn Asn Trp
            20   25   30

Val Asn Asn Tyr Leu Thr Cys Phe Tyr
        35   40

<210>   111
<211>   53
<212>   PRT
<213>   Homo sapiens

<400>   111

Ile Gln Arg Leu His Glu Val Asp Gln Val Asn Ile Pro Leu Trp Leu
1   5   10   15

Tyr Gln Asn Gly Gly Val Trp His Ile Arg His Leu Lys Ala Ala Gly
            20   25   30

Pro Cys Val Asp Leu Gly Leu Tyr Ala Val Ser Asn Ala Val Cys Ile
        35   40   45

Phe Glu Ser Phe Thr
        50

<210>   112
<211>   35
<212>   PRT
<213>   Homo sapiens

<400>   112

Tyr Gln Phe Thr Leu Leu Ile Gly Leu Ser Val Phe Leu Ile Leu Tyr
1   5   10   15

Thr Leu Ser Tyr Arg Leu Thr Ala Thr Cys Leu Gly Ile Pro Leu Met
            20   25   30

Ser Ile Tyr
        35

<210>   113
<211>   69
<212>   PRT
<213>   Homo sapiens

<400>   113

Ile Trp Leu Leu His Trp Ile Ser Asp Leu His Gly Ala Cys Ser Leu
1   5   10   15

Phe Val Leu Ala Asn Phe Ser Tyr Leu Glu Trp Leu Tyr Phe Pro Asn
            20   25   30

```
Ala Cys Thr Pro Ile Val Ser Arg Lys Tyr Asn Arg Tyr Val Leu Leu
        35              40                  45

Ile Val Lys Ala Tyr Arg Gln Lys Gly Leu Ala Leu Ser Gln Met Arg
    50                  55                  60

Leu Thr Gln Thr Val
65


<210>   114
<211>   60
<212>   PRT
<213>   Homo sapiens


<400>   114

Cys Lys Ser Met Asp Pro Leu Ser Leu Ser Ala Phe Pro Cys Leu Ile
1                5                  10                  15

Thr Asp Gly Leu Pro Gln Asn Gly Ala Arg Ile Glu Lys Gln Ile Thr
            20                  25                  30

Gln Ile His Ser Val Leu Gly Trp Val Cys Ser Asp Thr Cys Thr Ser
        35                  40                  45

Thr Gly Ala Ser Ala Gly Arg Ser Gly Leu Thr Glu
        50                  55                  60

<210>   115
<211>   2131
<212>   DNA
<213>   Homo sapiens

<400>   115
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tccctgggga cgtatagcac agcagcagca gacaaacctg ggttcagaac aagtccggct   180

tctgcctttt attggctgtc tgactgtagg aagttacttc ctcttattgc accttagtta   240

gctcgtttat tacatgaggg taaagcagta tctacctgat aggggattgg gaggattaaa   300

tgaggtaatc cattttaaa gggcttagaa tatacctgac acacagccag tgctcaacaa   360

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gaatgtgagg gcatcacgaa gatgagtatg gcagccaaga acctgtggct cccagacatt   780

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atcttctact tccccttcga ccagcagaac tgcacactca ccttcagctc attcctctac   960

acagtggaca gcatgttgct ggacatggag aaagaagtgt gggaaataac agacgcatcc  1020
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gccctcagct tctacctgcc agtgaaaagt gggaatcgtg tcccattcaa gataacgctc      1260

ctgctgggct acaacgtctt cctgctcatg atgagtgact tgctccccac cagtggcacc      1320

cccctcatcg tgtctactt cgccctgtgc ctgtccctga tggtgggcag cctgctggag      1380

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cagaaggaaa ataagggccc gggtctcacc cccacccacc tgcccggtgt gaaggagcca      1560

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ctatcatatc cccaaagatg actgagtctc tgctgtattc catgtatccc aatccggtcc      1920

tgctgatcaa ttccaatccc agacatttct ccctgttcct gcattttgtt ggcttccttc      1980

agtcctacca tatggttcta ggtccctctt acgtcatctg catagcagac tatacctctt      2040

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aaaaaaaaaa aaaaaaaaaa aaaaaaaaaa a      2131
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<210> 116
<211> 471
<212> PRT
<213> Homo sapiens

<400> 116

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Met Leu Ala Phe Ile Leu Ser Arg Ala Thr Pro Arg Pro Ala Leu Gly
1               5                   10                  15

Pro Leu Ser Tyr Arg Glu His Arg Val Ala Leu Leu His Leu Thr His
                20                  25                  30

Ser Met Ser Thr Thr Gly Arg Gly Val Thr Phe Thr Ile Asn Cys Ser
            35                  40                  45

Gly Phe Gly Gln His Gly Ala Asp Pro Thr Ala Val Asn Ser Val Phe
        50                  55                  60

Asn Arg Lys Pro Phe Arg Pro Val Thr Asn Ile Ser Val Pro Thr Gln
65                  70                  75                  80

Val Asn Ile Ser Phe Ala Met Ser Ala Ile Leu Asp Val Asn Glu Gln
                85                  90                  95

Leu His Leu Leu Ser Ser Phe Leu Trp Leu Glu Met Val Trp Asp Asn
            100                 105                 110
```

```
Pro Phe Ile Ser Trp Asn Pro Glu Glu Cys Glu Gly Ile Thr Lys Met
        115                 120                 125

Ser Met Ala Ala Lys Asn Leu Trp Leu Pro Asp Ile Phe Ile Ile Glu
    130                 135                 140

Leu Met Asp Val Asp Lys Thr Pro Lys Gly Leu Thr Ala Tyr Val Ser
145                 150                 155                 160

Asn Glu Gly Arg Ile Arg Tyr Lys Lys Pro Met Lys Val Asp Ser Ile
                165                 170                 175

Cys Asn Leu Asp Ile Phe Tyr Phe Pro Phe Asp Gln Gln Asn Cys Thr
                180                 185                 190

Leu Thr Phe Ser Ser Phe Leu Tyr Thr Val Asp Ser Met Leu Leu Asp
            195                 200                 205

Met Glu Lys Glu Val Trp Glu Ile Thr Asp Ala Ser Arg Asn Ile Leu
    210                 215                 220

Gln Thr His Gly Glu Trp Glu Leu Leu Gly Leu Ser Lys Ala Thr Ala
225                 230                 235                 240

Lys Leu Ser Arg Gly Gly Asn Leu Tyr Asp Gln Ile Val Phe Tyr Val
                245                 250                 255

Ala Ile Arg Arg Arg Pro Ser Leu Tyr Val Ile Asn Leu Leu Val Pro
        260                 265                 270

Ser Gly Phe Leu Val Ala Ile Asp Ala Leu Ser Phe Tyr Leu Pro Val
        275                 280                 285

Lys Ser Gly Asn Arg Val Pro Phe Lys Ile Thr Leu Leu Leu Gly Tyr
    290                 295                 300

Asn Val Phe Leu Leu Met Met Ser Asp Leu Leu Pro Thr Ser Gly Thr
305                 310                 315                 320

Pro Leu Ile Gly Val Tyr Phe Ala Leu Cys Leu Ser Leu Met Val Gly
                325                 330                 335

Ser Leu Leu Glu Thr Ile Phe Ile Thr His Leu Leu His Val Ala Thr
            340                 345                 350

Thr Gln Pro Pro Pro Leu Pro Arg Trp Leu His Ser Leu Leu Leu His
    355                 360                 365

Cys Asn Ser Pro Gly Arg Cys Cys Pro Thr Ala Pro Gln Lys Glu Asn
    370                 375                 380

Lys Gly Pro Gly Leu Thr Pro Thr His Leu Pro Gly Val Lys Glu Pro
385                 390                 395                 400

Glu Val Ser Ala Gly Gln Met Pro Gly Pro Ala Glu Ala Glu Leu Thr
            405                 410                 415

Gly Gly Ser Glu Trp Thr Arg Ala Gln Arg Glu His Glu Ala Gln Lys
            420                 425                 430

Gln His Ser Val Glu Leu Trp Leu Gln Phe Ser His Ala Met Asp Ala
    435                 440                 445

Met Leu Phe Arg Leu Tyr Leu Leu Phe Met Ala Ser Ser Ile Ile Thr
450                 455                 460
```

Page 40

Val Ile Cys Leu Trp Asn Thr
465   470

<210> 117
<211> 1465
<212> DNA
<213> Homo sapiens

<400> 117
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gttactttca ccatcaattg ctcagggttt ggccagcacg gggcggatcc cactgctctg     180

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gtcaacatct ccttcgcgat gtctgccatc ctagatgtga atgaacagct gcacctcttg     300

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gaatgcggag gcatcaagaa gtccggcatg gcaactgaga acctatggct ttcagatgtc     420

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tctatttccc cttccatgga cagaggtgaa cgctctcctt cagcccttttc acctacacag     600

gtaacccggg catggagaag gatgtccagg agctttcaaa tacatcacag aacctcattc     660

agaacaagga gggagtgggt actgctgggt atccaaaaaa gaacaataaa ggtgaccgtg     720

gccactaacc agtatgaaca agccatcttc catgtggcca tcaggcgcag gtgcaggccc     780

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agtttctacc tgccactgga aagtgggaat tgtgccccat tcaagatgac tgttctgctg     900

ggctacagcg tcttcctgct catgatgaat gacttgctcc cagccactag cacttcatca     960

catgcttcac tagtacgtgt ctacttcgcc ctgtgcctgt ccctgatggt gggcagcctg    1020

ctggagacca tcttcatcac ccacctgctg cacgtggcca ccaccagcc cctacctctg     1080

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gcgccccaga agggaaataa gggcccgggt ctcacccca cccacctgcc cggtgtgaag    1200

gagccagagg tatcagcagg gcagatgcca ggccctgggg aggcagagct gacaggggggc    1260

tcagaatgga caagggccca gcgggaacac gaggcccaga agcagcactc ggtggagctg    1320

tgggtgcagt tcagccacgc gatggacgcc ctgctcttcc gcctctacct gctcttcatg    1380

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<210> 118
<211> 357
<212> PRT
<213> Homo sapiens

<400> 118

```
Trp Asn Pro Asp Glu Cys Gly Gly Ile Lys Lys Ser Gly Met Ala Thr
1               5               10                  15

Glu Asn Leu Trp Leu Ser Asp Val Phe Ile Glu Glu Ser Val Asp Gln
            20              25                  30

Thr Pro Ala Gly Leu Met Ala Ser Met Ser Ile Val Lys Ala Thr Ser
        35              40                  45

Asn Thr Ile Ser Gln Cys Gly Trp Ser Ala Ser Ala Asn Trp Thr Pro
    50              55                  60

Ser Ile Ser Pro Ser Met Asp Arg Gly Glu Arg Ser Pro Ser Ala Leu
65              70                  75                  80

Ser Pro Thr Gln Val Thr Arg Ala Trp Arg Arg Met Ser Arg Ser Phe
            85                  90                  95

Gln Ile His His Arg Thr Ser Phe Arg Thr Arg Arg Glu Trp Val Leu
        100                 105                 110

Leu Gly Ile Gln Lys Arg Thr Ile Lys Val Thr Val Ala Thr Asn Gln
        115                 120                 125

Tyr Glu Gln Ala Ile Phe His Val Ala Ile Arg Arg Arg Cys Arg Pro
        130             135                 140

Ser Pro Tyr Val Val Asn Phe Leu Val Pro Ser Gly Ile Leu Ile Ala
145                 150                 155                 160

Ile Asp Ala Leu Ser Phe Tyr Leu Pro Leu Glu Ser Gly Asn Cys Ala
            165                 170                 175

Pro Phe Lys Met Thr Val Leu Leu Gly Tyr Ser Val Phe Leu Leu Met
            180                 185                 190

Met Asn Asp Leu Leu Pro Ala Thr Ser Thr Ser Ser His Ala Ser Leu
        195                 200                 205

Val Arg Val Tyr Phe Ala Leu Cys Leu Ser Leu Met Val Gly Ser Leu
    210                 215                 220

Leu Glu Thr Ile Phe Ile Thr His Leu Leu His Val Ala Thr Thr Gln
225                 230                 235                 240

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